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International application number: PCT/AU04/001756

International filing date: 15 December 2004 (15.12.2004)

Document type: Certified copy of priority document

Document details: Country/Office: AU
Number: 2004900364
Filing date: 27 January 2004 (27.01.2004)

Date of receipt at the International Bureau: 12 April 2005 (12.04.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)

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Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse

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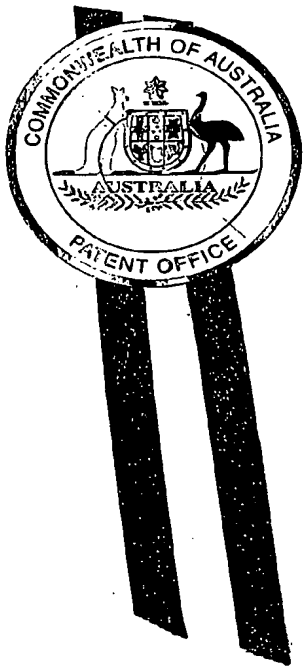
I, JANENE PEISKER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004900364 for a patent by LIGNOR PTY LTD as filed on 27 January 2004.



WITNESS my hand this
Fifth day of April 2005

JANENE PEISKER
TEAM LEADER EXAMINATION
SUPPORT AND SALES

Regulation 3.2

Lignor Pty Ltd

AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION

for the invention entitled:

"CONSTRUCTION STRAND LUMBER"

The invention is described in the following statement:

This invention relates to engineered wood products and more particularly to construction strand lumber products.

A number of man made timber products are known including chip board, medium density fibre board (MDF), plywood, laminated linear lumber (LVL) and oriented strand board (OSB).

Chip board lacks the strength for most structural applications. Plywoods suffer from the disability of requiring veneer sheets from relatively high grade logs. MDF products have a number of uses but lack the structural strength and moisture resistance for a range of applications. OSB and LVL products have considerable application but also suffer from a number of disadvantages. In particular the moisture resistance of these products is a difficulty and in many cases the strength of the material and its holding capacity for fastenings is highly directional.

LVL is the adaptation of an old technology from the plywood manufacturing and is also reliant on old or larger diameter trees for its resource. This provides a relatively low conversion rate from log to LVL product.

Laminated strand lumber (LSL) which is based on aspen and yellow poplar tree species is another man made timber product. It has found commercial use as a construction lumber. The product however is made from soft woods which can be grown relatively rapidly.

The present invention seeks to provide a construction strand lumber formed from hard wood strand that will overcome some of the above disadvantages or at least provide a useful alternative.

Accordingly, the present invention provides a construction strand lumber product

including substantially aligned strands of eucalypt and/or similar hard woods bonded together with a polymeric diphenyl methane di-ioscyanate (MDI) binder.

Preferably, the strands are of average length of about 145mm to 180mm. The strands are preferably about 25mm wide and about 0.5mm to 1.5mm thick. Preferably greater than 70% of the strands are completely aligned. The density of the formed product is preferably about 600 to 850 kgm^{-3}.

The strands are dried to preferably less than about 5% moisture content before being added to the bonding resin. In the preferred form of the invention the strands are formed into mat which is compressed using a steam compression process. The compression process preferably includes heating to above 100°C for at least 1 minute.

Preferably, the hardwood is blue gum (Eucalyptus Globulus) or other similar Eucalyptus species such as Karri.

Preferably, the construction strand lumber grown for this invention also incorporates a waterproofing additive. Suitable waterproofing additives contain a wax. In the preferred form of the invention other chemical agents can be incorporated into the product in order to impart or enhance desired qualities. For example, additives to protect against termites, provide fungal resistance and fire retardant characteristics can be added. In the preferred process these additives are added to the strands during a resination stage prior to the steam process. This allows the treatment effect to be evenly distributed throughout the matrix of the product.

The lumber product of this invention has been demonstrated to provide a number of advantages over prior art soft wood based products. The product exhibits high moisture resistance and shows a very low swell rate in the presence of moisture. Additionally, screw and nail holding performance is high in all planes. The density profile of the product is also substantially uniform. Other advantages of the product according to the present invention include:

- Up to 70% of the logs used can be converted to finished product.

- The balance of 30% is rejected strands from the bark which can be burnt to generate heat and steam for the plant process. This in effect uses the whole log with almost no waste.

- The product is hard wood based with a higher surface soundness making it suitable for industrial flooring and sea container flooring.

- The product can be routed, milled or profiled for use in window frames and other similar wood joinery products. In these applications a low swell factor, ability to be treated for termite and mould resistance is important.

- The MDI resin is not affected by sunlight or water which makes the product suitable for application in weathering situations. This means that it is particularly suitable for use as a power pole cross-arm, for example, which product is normally treated for termite and fire resistance.

- In comparison to prior art products, such as LVL, the product of this invention has extra strength but slightly higher density. This allows it to be used in a smaller section, reducing overall weight in the same application.

- The product of this invention has a minimum lifetime of the order of 50 years in a structure. This period plus the growth period "locks up" carbon for 60-70 years and makes the product acceptable to obtain a future "carbon credit".

- The product of this invention uses relatively small diameter trees (150 to 200mm diameter) which are typically 8 to 12 years old. Lumber products such as LVL require large trees of the order of 500mm in diameter and are usually 40 or more years old. Consequently the present invention allows plantation land to be recycled

earlier for replanting, improving the use of the land and increasing "carbon locking" capacity per hectare.

The product of this invention uses a resin glue that becomes totally benign after production. As a consequent the product can be sawn like convention lumber with no emissions, for example of formaldehyde, as found in many other engineered wood products.

One embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawing which is a schematic illustration of the process for making the construction strand lumber product of this invention.

As shown in the drawing, the process begins with harvested eucalypt or other similar hard wood logs. The preferred eucalypt logs are bluegum logs from trees of the order of 8 to 12 years old and having a diameter of around 150 to 200mm.

The logs are debarked before passing through a strander processor. A ring strander is used and is capable of cutting fixed lengths of logs as well as random lengths of logs with precision accuracy into strands of specified length, width and thickness. The strands are preferably formed of a length of about 145mm to 180mm a width of about 25mm and a thickness of about 0.5 to 1.5mm. The waste bark or rejected strands and fines provide the fuel for the main heat generating plant used later in the process. Waste hot gas from the heat plant dries the green strands. The green strands are dried to less than 5% moisture.

Once dried the strands are classified in drum sieves to ensure only strands meeting product specifications are included into the process stream.

From the classifier the strands are conveyed on demand to a resin blender. In the resin blender the MDI resin and wax is added in required proportion and mixed to the strands. Suitable other additives such as fire retardants can be added at this point in the process. The mixing of the additives at this stage ensures uniform distribution throughout

the finished product matrix.

The mixed strand resin and wax known as "furnish" is held in a holding bin, the furnish is supplied to a mat former where the strands are aligned and deposited in a mat of the required mass. The combination of alignment and mass controls the mechanical properties of the thickness produced. The strands are formed in substantially aligned or unidirectional arrangement. In some applications a further layer with strands aligned at 90° can be formed for other applications. In this form it is usually preferred to have a further layer in the same direction as the first layer sandwiching the intermediate 90° layer.

After mat forming weight checking, infrared moisture detection and metal detection steps are performed. Any rejected matting is conveyed either to waste or returned for further processing.

Mats meeting the selected criteria are then processed through a continuous steam press. In this process the mat is heated to above 100°C for at least 1 minute. In the preferred form of the invention a Siempelkamp ContiRoll continuous press. The product sized from 80 mm through to 90 ml in thickness in boards or billets, 2.7m wide and up to 15 meters long can readily be produced.

After cooling billets can be trimmed and sawn into construction timber products. The product is fully structural rated, free of knots, bow, twist and wane. Suitable applications include flooring, structural wood products, beams and columns, headers and lintels, joists and rafters, walls, studs and plates, and joinery products.

In tests using bluegum logs and karri thinnings, products with the following characteristics have been produced:

1. Modulus of elasticity in the range of 14,000 N/mm^2 for bluegum and 20,000 N/mm^2 for karri thinnings.

2. Swell of less than 20% in a standard 24 hour moisture swell test.

3. Internal bond strength of 1.21 N/mm^2.

4. High screw and nailing performance in all planes.

5. Uniform density profile.

6. A surface soundness of 2.42 N/mm^2.

The foregoing describes only one embodiment of the present invention and modifications can be made without departing from the scope of the invention.

DATED this 27th day of January, 2004

LIGNOR PTY. LTD.

By its Patent Attorneys
DAVIES COLLISON CAVE

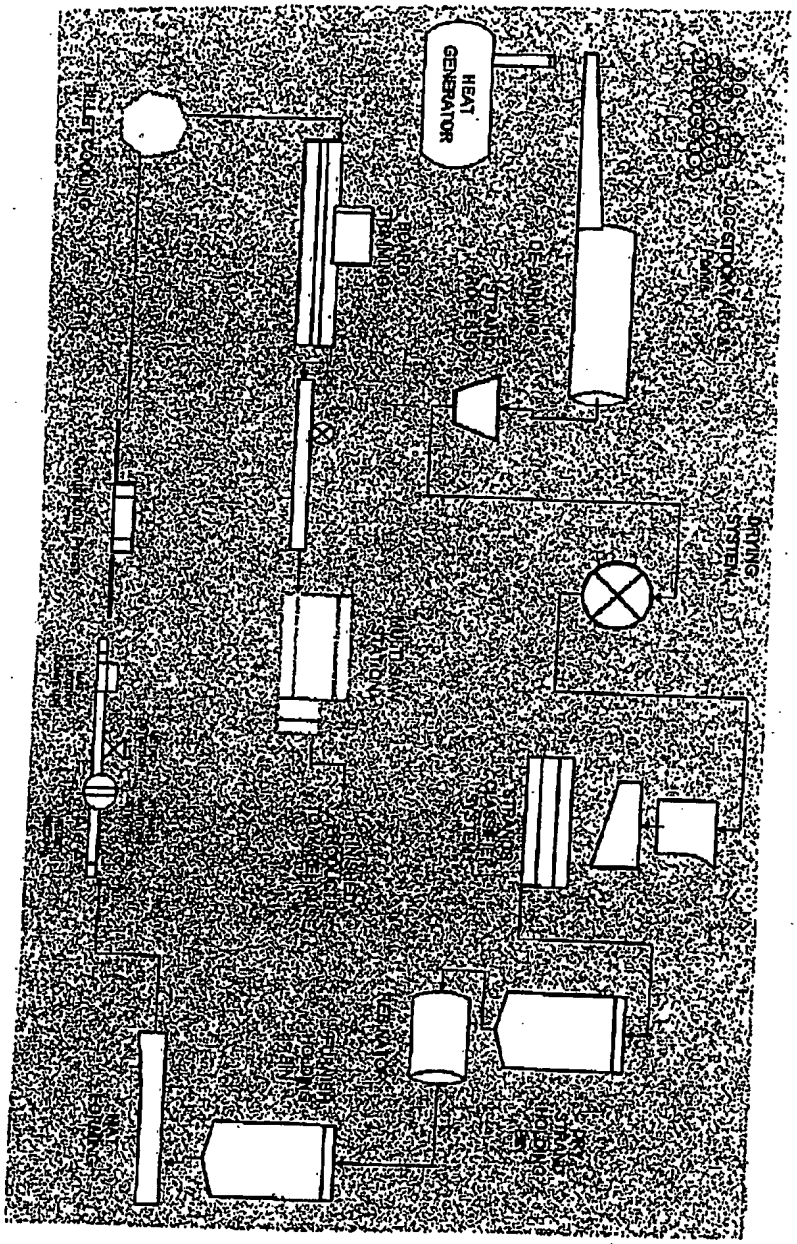


FIGURE 1

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

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Date of mailing *(day/month/year)* 19 April 2005 (19.04.2005)	
Applicant's or agent's file reference 12494952	**IMPORTANT NOTIFICATION**
International application No. PCT/AU04/001756	International filing date *(day/month/year)* 15 December 2004 (15.12.2004)
International publication date *(day/month/year)*	Priority date *(day/month/year)* 27 January 2004 (27.01.2004)
Applicant LIGNOR PTY LTD et al	

1. By means of this Form, which replaces any previously issued notification concerning submission or transmittal of priority documents, the applicant is hereby notified of the date of receipt by the International Bureau of the priority document(s) relating to all earlier application(s) whose priority is claimed. Unless otherwise indicated by the letters "NR", in the right-hand column or by an asterisk appearing next to a date of receipt, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).

2. *(If applicable)* The **letters "NR"** appearing in the right-hand column denote **a priority document which, on the date of mailing of this Form, had not yet been received by the International Bureau** under Rule 17.1(a) or (b). Where, under Rule 17.1(a), the priority document must be submitted by the applicant to the receiving Office or the International Bureau, but the applicant fails to submit the priority document within the applicable time limit under that Rule, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

3. *(If applicable)* **An asterisk (*)** appearing next to a date of receipt, in the right-hand column, denotes **a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b)** (the priority document was received after the time limit prescribed in Rule 17.1(a) or the request to prepare and transmit the priority document was submitted to the receiving Office after the applicable time limit under Rule 17.1(b)). Even though the priority document was not furnished in compliance with Rule 17.1(a) or (b), the International Bureau will nevertheless transmit a copy of the document to the designated Offices, for their consideration. In case such a copy is not accepted by the designated Office as the priority document, Rule 17.1(c) provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
27 January 2004 (27.01.2004)	2004900364	AU	12 April 2005 (12.04.2005)

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